# MECHANICAL ULCER OF STUMP.

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I have ventured to propose the name which heads this paper for the chronic ulceration so often observed, in badly managed stumps, over the exposed end of the bone. The study of several of these cases has led me to the conclusion that the chief obstacle to cicatrization is the tension of the soft parts acting mechanically by resisting the extension of the integument over the end of the bone, and thus admitting of only a very slow and imperfect mode of repair by granulation. It is rare to see this ulcer larger than the area of the cross section of the bone, for the vital contraction which takes place in the development of granulations is almost always sufficient to draw the cut edges of the skin close up to the margin of the bone, leaving it alone to heal, if at all, by less perfect methods. Mechanical ulcer, therefore, is one of the common attendants upon that form of failure known as conical or sugar-loaf stump, and is dependent upon the same cause, viz., the excessive length of the bone as compared with the soft parts left to cover it. Defective methods of operating and of dressing have much to do with causing this accident, as I have already explained in a former paper read before this Society ("On Amputation of the Thigh," see Boston Medical and Surgical Journal for June 11 and 18, and July 9 and 16). I propose now to consider the treatment of this accident, including, as it does, a few thoughts upon the improvement of bad stumps.

In some instances it may be necessary to shorten the bone by removing a section with the saw. This I have not hesitated to do in cases where there was decided projection of the bone denuded of soft tissues, thus saving a very tedious exfoliation extending over a period of several months. The other and chief indication is the complete relaxation of the skin at the end of the stump, so that as cicatrization advances the margins of the integument may be

drawn inward towards the centre of the bone. This indication is fully met in the thigh and arm, and to a less degree in the forearm and leg, by the application of a roller compressing the muscles of the stump as high as the next articulation. The tension is thus immediately relieved and the soft parts are forced down so as to form a ring-shaped cushion projecting beyond the end of the bone, which now lies safe at the bottom of a little cavity in the end of the stump, instead of forming the prominent apex of the cone. To secure the full benefit of the roller, it should be firmly and evenly applied from above downwards, so as to compress the muscles of the stump throughout their entire length. In short stumps of the thigh it is generally necessary to take a few turns around the pelvis, approaching the thigh in the manner of the "spica," and in all cases the roller should stop an inch or two above the end of the stump, to keep the lower turns from slipping off. Flannel is perhaps the best material for the roller, as from its elasticity it can be more smoothly applied, and can be worn with greater comfort than linen or cotton.*

The following case, which is one of a very considerable number which I have treated by the same method, will serve to illustrate my views upon the nature and treatment of this disease.

J. M., of the 4th Infantry, was wounded in action Dec. 14th, 1862. The thigh was amputated the same day, three inches above the knee. He remained under treatment in hospital for six months, suffering from several attacks of gangrene, erysipelas, &c., and was discharged July 1st, 1863, with a conical stump. In August, he had a fall, striking the end of the stump upon the ground, and exciting destructive action in the imperfectly developed tissues which covered the end of the bone. Oct. 17th, he came under my care. At that time the bone projected beyond the soft parts and was covered only by a thin layer of granulations which showed no tendency to farther development. The skin around the bone was quite tense, and the whole end of the stump was tender and painful. I immediately applied a roller, taking a few turns around the pelvis, and rolling the stump from above downwards to within a couple of inches of the end. The effect of this application of the roller was to push down the skin and muscles, thus rendering them perfectly lax and causing the soft parts to project as a ring-shaped cushion around and beyond the end of the bone. The granulating bone, which now lay at the bottom of a little cavity in the soft parts, was covered with dry lint, and the dressing was completed by covering the end of the stump with a square piece of cloth confined by a few turns of a roller. The excessive tenderness of

* The use of the roller in this manner to prevent retraction of the soft parts was formerly taught as an essential part of the after-treatment in all cases of amputation in the continuity of the thigh and arm, and I believe that it is to the neglect of this precaution that many of the bad results, now so often seen, are to be attributed.

the ulcer was immediately relieved, but returned whenever the roller became loose, to be again relieved by its re-adjustment. In two or three days a marked improvement took place in the aspect of the ulcer, which had already begun to cicatrize, and in the course of a fortnight it was reduced to a third of its former area. At the end of a month the ulcer was not larger than a silver three-cent piece, and it has since completely healed. The soft parts project three quarters of an inch (by actual measurement) beyond the end of the bone, forming a thick ring-shaped cushion. At the time of dressing, or whenever the roller becomes loose, the end of the stump becomes nearly flat, but without prominence of the bone. The soft parts have become much more lax under the use of the roller, and the effect of the circular compression becomes every day more and more evident. I have directed the patient to continue the use of the roller until the soft parts become thoroughly consolidated in their present position.

[An old method of relaxing the soft parts by means of several strips of adhesive plaster applied lengthwise to the sides of the stump and attached to a brick or other weight hung over the foot of the bed, has been very ingeniously modified by Mr. B. F. D. Adams, surgical house-pupil at the Mass. Gen. Hospital, and is now frequently employed in the surgical wards of that institution. This plan succeeds very well during the few weeks immediately following the amputation, and while the patient is still confined to his bed, but it can hardly be applied to the treatment of mechanical ulcer, continuing, as it does, for many months beyond the period over which the surgical treatment of a stump usually extends. In this very method, morever, a roller is applied over the strips of plaster to keep them from slipping, and the result is no better than that which follows the use of the roller alone.]

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